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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/729,816	12/06/2000	Takuji Matsumoto	200504US2	6963

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EXAMINER	
OWENS, DOUGLAS W	

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 11/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/729,816	MATSUMOTO ET AL.	
	Examiner	Art Unit	
	Douglas W Owens	2811	

-- The MAILING DATE of this communication app ars on the cover sheet with the correspond nce address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,15 and 17-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,15,17-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claims 15 and 17 – 22 are objected to because of the following informalities:

The word "so" should be deleted from line 17 of claim 15, line 18 of claim 17 and line 17 of claim 18. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1 – 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1 recites the limitation, "...a silicon nitride film formed on *the whole surface* of said first oxide film..." (emphasis added). The specification does not teach a silicon nitride film on the whole surface of the first oxide film, where the whole surface is taken to include the upper surface, side surfaces of the contact hole and the bottom surface formed on the first and second active regions.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 – 8, 15 and 17 – 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation, "...a silicon nitride film formed on the whole surface of said first oxide film...". The scope of the claim is vague since the surfaces of the first oxide film that are meant to encompass "the whole surface" are not defined in the claim.

Claim 15 recites the limitation "...said first and second oxide..." in line 26. There is insufficient antecedent basis for this limitation in the claim. The scope of claim 15 and its dependent claims cannot be determined, since the location of the first and second oxide layer introduced in line 26 cannot be determined with respect to the other cited elements of the structure.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 6,320,234 to Karasawa et al. in view of admitted prior art and US patent No. 5,726,499 to Irinoda.

Regarding claim 1, as well as an indefinite claim can be understood, Karasawa et al. teaches a semiconductor device (Fig. 1) comprising:

a substrate (10) having a first active region (16) of a first conductivity type and second active region (18) of a second conductivity type, the first and second active regions being disposed in a semiconductor region;

an isolation insulating film (20) between the first and second active regions;

a first interlayer insulating film (66) on the first and second active regions and a surface of the isolation insulating film;

a second interlayer insulating film (74) on the first interlayer insulating film; and

at least one wire on the second interlayer insulating film (Col. 6, lines 65 – 66).

Karasawa et al. is silent with respect to the material used for the first and second interlayer insulating films. Oxide is commonly used in the art as a material for interlayer insulation layer. It would have been obvious to one of ordinary skill in the art to use an oxide, since it is a known material that is well suited for the intended use. The selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Karasawa et al. does not teach a silicon nitride layer on the whole surface of the first interlayer insulating film. Irinoda teaches a silicon nitride layer between layers of interlayer insulating film (Fig. 11; 512, 612). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the nitride layer taught by Irinoda into the device taught by Karasawa et al., since it is desirable to prevent unwanted diffusion of impurities, prevent penetration of moisture and control etching of the contact holes.

Neither Karasawa et al., nor Irinoda teach an SOI substrate. Admitted prior art teaches an SOI substrate (Fig. 22). It would have been obvious to one of ordinary skill in the art to incorporate the use of an SOI substrate since it is desirable to reduce parasitic capacitance, and prevent latch-up, thus increasing device operation speed. If the proposed modification were made, the resulting device would have further had a first semiconductor region between the isolation insulating film (20) and the surface of the insulative substrate.

Regarding claim 7, Karasawa et al. does not teach a device, wherein the silicon nitride film includes a silicon nitride film formed entirely on the first oxide except where contact holes are formed. Irinoda teaches a device, wherein the silicon nitride film is formed on the interlayer insulating film except a portion where contact holes are formed. It would have been obvious to one of ordinary skill in the art to incorporate the teaching of Irinoda into the device taught by Karasawa et al. for reasons discussed above.

Response to Arguments

8. Applicant's arguments filed September 4, 2003 have been fully considered but they are not persuasive.

9. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The Applicant argues that it would not have been obvious to modify the device taught by Irinoda to arrive at the claimed invention. However, there has been no

suggestion to modify the invention of Irinoda. Irinoda teaches the use of a silicon nitride mask that would have been obvious to incorporate into the invention of Karasawa et al. for reasons cited above. If the suggested modification had been made to Karasawa et al., the silicon nitride layer would have necessarily been formed over the whole upper surface of the first interlayer insulating film.

10. In response to applicant's argument that it would not have been obvious to combine the admitted prior art teaching of an SOI substrate with the suggested device of Karasawa et al. and Irinoda for the purpose of shortening the lifetime of carriers, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The SOI substrate also prevents latch-up (Admitted prior art, page 1) and reduces parasitic capacitance.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 703-308-1690. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

DWO

EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800